

REMARKS

Claim Rejections

Claims 7-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shibuya et al. (U.S. 4,411,982) in view of Cho (U.S. 6,914,196) and Leppard et al. (U.S. 6,361,925).

Drawings

It is noted that the Examiner has accepted the drawings as originally filed with this application.

New Claims

By this Amendment, Applicant has canceled claims 7-9 and has added new claims 16-18 to this application. It is believed that the new claims specifically set forth each element of Applicant's invention in full compliance with 35 U.S.C. § 112, and define subject matter that is patentably distinguishable over the cited prior art, taken individually or in combination.

The new claims are directed toward a flexible circuit tape comprising: a plurality of tape type flexible printed circuits (60) arranged in a plurality of separable rows, each tape type flexible printed circuit of the tape type flexible printed circuits having: a flexible insulated layer (64) having a thickness between 10µm and 75µm; a plurality of copper traces (31) formed on the flexible insulated layer and having a thickness between 5µm and 40µm; a cover layer (51) formed directly on a top of the flexible insulated layer and the plurality of copper traces and having a thickness between 10µm and 75µm, the cover layer having a plurality of hollow portions (53), connection terminals (32) of each of the plurality of copper traces aligning with and being exposed through one of the plurality of hollow portions of the cover layer; and a plurality of sprocket holes (61) located on each of two opposing sides thereof, wherein adjacent tape type flexible printed circuits of the plurality of tape type flexible printed circuits are separated by a plurality of parallel cutting lines (23), the plurality of parallel cutting lines are located between the plurality of sprocket holes of the adjacent tape type flexible printed circuits.

Other embodiments of the present invention include: the cover layer is selected from a group of material consisting of polyimide, polyester, and photoimagible solder mask; and an electroplating layer located on of each of the connection terminals of each of the plurality of copper traces.

The primary reference to Shibuya et al. teaches flexible printed circuits having a substrate (1a), two copper conductors (1b) connected by a copper film (33), perforations (19), a plurality of through holes (20, 20'), and a solder resist film (45).

Shibuya et al. do not teach a plurality of tape type flexible printed circuits arranged in a plurality of separable rows; each tape type flexible printed circuit of the tape type flexible printed circuits having a cover layer formed directly on a top of the flexible insulated layer and the plurality of copper traces; the cover layer having a plurality of hollow portions; connection terminals of each of the plurality of copper traces aligning with and being exposed through one of the plurality of hollow portions of the cover layer; adjacent tape type flexible printed circuits of the plurality of tape type flexible printed circuits are separated by a plurality of parallel cutting lines; nor do Shibuya et al. teach the plurality of parallel cutting lines are located between the plurality of sprocket holes of the adjacent tape type flexible printed circuits.

The secondary reference to Cho teaches a reel-deployed printed circuit board (70) having a flexible base board (68), and unit boards (6) having slits (67), contacts (63), and connector bars (66), and an encapsulation located on a bottom of the flexible base board.

Cho does not teach a plurality of tape type flexible printed circuits arranged in a plurality of separable rows; each tape type flexible printed circuit of the tape type flexible printed circuits having a cover layer formed directly on a top of the flexible insulated layer and the plurality of copper traces; the cover layer having a plurality of hollow portions; connection terminals of each of the plurality of copper traces aligning with and being exposed through one of the plurality of hollow portions of the cover layer; adjacent tape type flexible printed circuits of the plurality of tape type flexible printed circuits are separated by a plurality of parallel cutting lines; nor does Cho teach the plurality of parallel cutting lines are located between the plurality of sprocket holes of the adjacent tape type flexible printed circuits.

The secondary reference to Leppard et al. is cited for teaching a polyester resin.

Leppard et al. do not teach a plurality of tape type flexible printed circuits arranged in a plurality of separable rows; each tape type flexible printed circuit of the tape type flexible printed circuits having a cover layer formed directly on a top of the flexible insulated layer and the plurality of copper traces; the cover layer having a plurality of hollow portions; connection terminals of each of the plurality of copper traces aligning with and being exposed through one of the plurality of hollow portions of the cover layer; adjacent tape type flexible printed circuits of the plurality of tape type flexible printed circuits are separated by a plurality of parallel cutting lines; nor do Leppard et al. teach the plurality of parallel cutting lines are located between the plurality of sprocket holes of the adjacent tape type flexible printed circuits.

Even if the teachings of Shibuya et al., Cho, and Leppard et al. were combined, as suggested by the Examiner, the resultant combination does not suggest: a plurality of tape type flexible printed circuits arranged in a plurality of separable rows; each tape type flexible printed circuit of the tape type flexible printed circuits having a cover layer formed directly on a top of the flexible insulated layer and the plurality of copper traces; the cover layer having a plurality of hollow portions; connection terminals of each of the plurality of copper traces aligning with and being exposed through one of the plurality of hollow portions of the cover layer; adjacent tape type flexible printed circuits of the plurality of tape type flexible printed circuits are separated by a plurality of parallel cutting lines; nor does the combination suggest the plurality of parallel cutting lines are located between the plurality of sprocket holes of the adjacent tape type flexible printed circuits.

It is a basic principle of U.S. patent law that it is improper to arbitrarily pick and choose prior art patents and combine selected portions of the selected patents on the basis of Applicant's disclosure to create a hypothetical combination which allegedly renders a claim obvious, unless there is some direction in the selected prior art patents to combine the selected teachings in a manner so as to negate the patentability of the claimed subject matter. This principle was enunciated over 40 years ago by the Court of Customs and Patent Appeals in In re Rothermel and Waddell, 125 USPQ 328 (CCPA 1960) wherein the court stated, at page 331:

The examiner and the board in rejecting the appealed claims did so by what appears to us to be a piecemeal reconstruction of the prior art patents in the light of appellants' disclosure. ... It is easy now to attribute to this prior art the knowledge which was first made available by appellants and then to assume that it would have been obvious to one having the ordinary skill in the art to make these suggested reconstructions. While such a reconstruction of the art may be an alluring way to rationalize a rejection of the claims, it is not the type of rejection which the statute authorizes.

The same conclusion was later reached by the Court of Appeals for the Federal Circuit in Orthopedic Equipment Company Inc. v. United States, 217 USPQ 193 (Fed.Cir. 1983). In that decision, the court stated, at page 199:

As has been previously explained, the available art shows each of the elements of the claims in suit. Armed with this information, would it then be non-obvious to this person of ordinary skill in the art to coordinate these elements in the same manner as the claims in suit? The difficulty which attaches to all honest attempts to answer this question can be attributed to the strong temptation to rely on hindsight while undertaking this evaluation. It is wrong to use the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit. Monday morning quarterbacking is quite improper when resolving the question of non-obviousness in a court of law.

In In re Geiger, 2 USPQ2d, 1276 (Fed.Cir. 1987) the court stated, at page 1278:

We agree with appellant that the PTO has failed to establish a *prima facie* case of obviousness. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination.

Applicant submits that there is not the slightest suggestion in either Shibuya et al., Cho, or Leppard et al. that their respective teachings may be combined as suggested by the Examiner. Case law is clear that, absent any such teaching or suggestion in the prior art, such a combination cannot be made under 35 U.S.C. § 103.

Neither Shibuya et al., Cho, nor Leppard et al. disclose, or suggest a modification of their specifically disclosed structures that would lead one having ordinary skill in the art to arrive at Applicant's claimed structure. Applicant hereby respectfully submits that no combination of the cited prior art renders obvious Applicant's new claims.

Summary

In view of the foregoing amendments and remarks, Applicant submits that this application is now in condition for allowance and such action is respectfully requested. Should any points remain in issue, which the Examiner feels could best be resolved by either a personal or a telephone interview, it is urged that Applicant's local attorney be contacted at the exchange listed below.

Respectfully submitted,

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